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Martin, AM, Champ, F and Franklin, Z (2021) COVID-19: Assessing the impact of lockdown on recreational athletes. Psychology of Sport and Exercise, 56. p. 101978. ISSN 1469-0292

DOI: https://doi.org/10.1016/j.psychsport.2021.101978

Publisher: Elsevier

Version: Accepted Version

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Additional Information: This is an Author Accepted Manuscript of an article published in Psychology of Sport and Exercise, by Elsevier.

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COVID-19: Assessing the impact of lockdown on recreational athletes

Anna May Martin, Francesca Champ, Zoe Franklin

Abstract

Background and aims: The COVID-19 pandemic has resulted in associated lockdown restrictions for individuals across England, including the postponement of all recreational sporting provisions. The beneficial effects of regular physical activity are well established yet to the authors' knowledge, no research addresses the cancellation of all recreational provisions. Using quantitative and qualitative methods, this study assessed the impact of COVID-19 restrictions on recreational sports players, what alternative exercise methods have been sought and how players feel about returning to their sport.

Method: An online survey was distributed across England for six-weeks commencing in May 2020. A questionnaire explored differences in the impact of COVID-19 restrictions between sex, winter/summer/year-round sports, team/individual sports, age, and resilience groups. The use of alternative exercise methods, coping strategies and feelings about returning to sport were also investigated. Responses were gathered from 2023 adults whose recreational sport had been cancelled by COVID-19. All completed questionnaires (n = 1213) were taken for analysis (mean age = 49.41 years, SD = 17.165, 55.2% female).

Results: Quantitative findings showed the negative impact of COVID-19 restrictions was greater for females, those involved in winter and team sports, those aged 18–39 and low-resilient copers ($p < .05$). No significant differences were found between individuals that had had COVID-19 or were considered vulnerable by government guidelines. Acceptance was the most common coping strategy. The average number of days per week that participants exercised significantly increased during lockdown, with significant increases also seen in the use of online workouts, fitness apps and home-gym exercise. Qualitative findings suggested that participants are looking forward to the social and physical benefits of recreational activity restarting yet are concerned about the logistics of returning under social distancing restrictions. Other worries included loss of fitness, spreading (younger age groups) and catching (older age groups) COVID-19 and being in a crowd.

Conclusions: Results highlight what is currently accessible to home-based exercisers and inform the reintroduction of recreational sports clubs. As COVID-19 restrictions look to persist, club representatives should provide accessible home-exercise options and be cautious of participant concerns when considering the return of recreational sport.

Keywords: COVID-19, Lockdown, Recreational, Sport, Exercise, Activity

1. Introduction

The COVID-19 virus and associated lockdown restrictions beginning in March 2020 caused an unprecedented change to all aspects of professional, social, and personal lives, including recreational sporting provisions. Although the introduction of some recreational sport was reinitiated after the easing of lockdown restrictions during Summer 2020 (with additional COVID-19 precautions in place e.g., socially distanced training), further national lockdowns in November 2020 and January 2021, caused additional terminations of all recreational provisions.

Recreational sport refers to physical activity that occurs during leisure time (Tsorbatzoudis et al., 2006) and focuses typically on participation, as opposed to winning material or extrinsic rewards (Chatzisarantis & Hagger, 2007). Although a competitive element is often included within recreational activities (e.g., fun leagues), it is often not considered the primary motive as with elite and professional sport. At all levels, sport and physical activity are widely understood to have physical, social and psychological health benefits including prevention of cardiovascular diseases, osteoarthritis and osteoporosis (Downward & Rasciute, 2011), providing opportunities for social interaction, companionship and feelings of belonging (Eime et al., 2013) and enhancing self-esteem and self-regulation (Clark et al., 2015).

Although the benefits and motives of participating in recreational sport are well researched, there is little (if any) research that addresses the psychosocial impact of all recreational provisions being removed. Despite the allowance of (some) exercise in lockdown restrictions, during the toughest UK restrictions, individuals were only permitted to exercise outside their house once a day. Recently published evidence suggests COVID-19 restrictions caused decreases in physical activity across Spain (López-Bueno et al., 2020) and Italy (Maugeri et al., 2020), and in vigorous activity across France and Switzerland (Cheval et al., 2020, pp. 1–16). Additionally, Ammar et al. (2020) confirmed lockdown restrictions had a negative effect on physical activity intensity levels and increased daily sitting time from 5 to 8 h per day. In particular, individuals aged 18–29 reported reduced physical activity during lockdown (Faulkner et al., 2020); attributed to their typical engagement with activities reliant on sporting infrastructure which is currently unavailable. Finally, Son et al. (2020, pp. 1–8) suggested that leisure professionals should promote activity in older adults during lockdown by increasing home-based opportunities and offering online leisure services; these recommendations could be extended to the whole population.

Beyond the effects on exercise participation, those under the age of 35 showcased the highest levels of mental health problems (depression, anxiety, stress) during the pandemic (Pieh et al., 2020). Younger adults also showed increased levels of perceived anger and stress during lockdown (Shanahan et al., 2020). This study builds on current findings by further investigating changes in exercise participation and the psychological impact of lockdown. Presently, no articles have sampled recreational athletes, assessed alternative exercise methods or addressed feelings about returning to sport – a clear gap in the literature.

The potential impact of COVID-19 on individual exercise and mental health will likely be affected by their level of resilience and coping mechanisms. Coping represents an individual's cognitive and behavioural efforts to manage specific external and/or internal demands that are appraised as exceeding the resources of the person (Lazarus & Folkman, 1984). During the COVID-19 pandemic, research suggests that accepting the presence of the virus, using self-distraction (Umucu & Lee, 2020) and engaging in physical activity (Shetcher et al., 2020) reduces the potential negative impact of COVID-19. Coping and successful management of setbacks is often attributed to the concept of resilience (Wagstaff et al., 2016) which impacts how an event is appraised and influences the stress

process at multiple stages (e.g., the selection of coping strategies). This differs to coping, which refers to the strategies employed following the appraisal of a stressful encounter (Fletcher & Sarkar, 2013). Resilience can subsequently be thought of as "the role of mental processes and behaviour in promoting personal assets and protecting an individual from the potential negative effect of stressors" (Fletcher & Sarkar, 2012, p. 675). Resilience is important to investigate alongside responses to COVID-19 stressors as higher resilience positively relates to greater quality of life (Kermott et al., 2019), directly affects psychological and physical ill-health and indirectly affects the perception of stressors (Johnson et al., 2019). Additionally, resilience plays a role during injury rehabilitation (a comparative time away from sport), by maintaining an athlete's motivation and controlling stress (Codonhato et al., 2018) and hence those with higher resilience manage better during injury, and potentially during lockdown.

To summarise, the COVID-19 pandemic has significantly influenced individual's abilities to engage with recreational exercise, yet at present, the experiences of recreational athletes have been overlooked. The current paper addressed this gap and aimed to investigate (a) the psychosocial impact of COVID-19 restrictions on recreational sport participants, (b) what alternative exercise methods have been used and (c) feelings about returning to sport. These new understandings offer the potential to provide insight into how sports and/or health organisations (e.g. local clubs, national governing bodies) might best support athletes pre, during and post-lockdown, especially as developing mechanisms for home-based exercise will be essential in remaining active during current and future local/national lockdowns. The following research questions are proposed, (1) What is the impact of COVID-19 restrictions on recreational sports players, and does this differ between (a) age and (b) resilience groups? (c) what coping strategies did recreational sports players use during lockdown?; (2) What alternative exercise methods have been sought and (a) does this differ between age groups?; (3) How are recreational sports players feeling about returning to sport, and (a) does this differ between age groups?

2. Method

2.1. Study design

Upon attaining institutional ethical approval, an online survey (created using FreeOnlineSurveys) was distributed using convenience, snowball and voluntary response sampling. The online survey was distributed to personal contacts (WhatsApp, e-mail) and potential participants through social media (Twitter and Facebook). Additionally, recreational sports clubs were contacted directly (sourced through Active County websites) and invited to participate. Recruitment emails contained information about the research, the link to the online survey and contact details for the research team. At the start of the questionnaire, participants read an information sheet, provided informed consent and were assured of confidentiality/right to withdraw. Participants were eligible for participation in the study if they were over 18 years old and their recreational sport had been cancelled/postponed by COVID-19.

The online survey was live for 6 weeks starting on May 7, 2020 and ending on June 18, 2020. Across the duration of data collection, COVID-19 restrictions allowed the public to leave home only for essential reasons, including work (where it cannot be done from home), outside exercise once a day and essential food shopping. Households were unable to meet and social distancing was enforced.

2.2. Participants

A total of 2023 participants were recruited, with a final participant sample size of 1213 (mean age = 49.41 years, SD = 17.165, range = 18–87years) after incomplete and invalid questionnaires were removed. Participants indicated demographic and COVID-19 specific characteristics (Table 1). Of the final sample, 55.2% were female, 44.7% were male and 0.1% preferred not to say. A total of 37 main sports were identified (Supplementary Material 1). Sports accounting for the largest percentages included Bowls (8%), Running (7.7%), Hockey (7.5%), Athletics (7.3%), Cycling (5.6%) and Netball (5.6%). Across all sports, 54.2% were classed as individual (45.8% Team), and Summer (8.4%), Winter (8.3%) or Year-round (83.3%) sports as categorized by participants. Age group analysis was used for each research question and hence participants were classified into age groups (years) in accordance with the life stages (<18, 18–39, 40–64 and ≥ 65; see Fuchs et al., 2019) with 31.3% aged 18–39, 46.9% aged 40–65 and 21.8% aged 65 Plus.

Table 1. Participant descriptive statistics and COVID-19 demographic information.

		Total Sample	**18–39 Years**	**40–65 Years**	**65 Plus Years**
Number of Participants		**1213**	**380 (31.3%)**	**569 (46.9%)**	**264 (21.8%)**
Gender	Male	542 (44.7%)	256	307	107
	Female	670 (55.2%)	123	262	157
	Prefer not to say	1 (0.1%)	1	0	0
Ethnicity	Asian	12 (1%)	5	7	0
	Black or African American	5 (0.4%)	1	3	1
	Mixed Race	8 (0.7%)	5	3	0
	Other	5 (0.4%)	1	2	2
	White or Caucasian	1183 (97.5%)	368	554	261
Had the COVID-19 virus?	Yes	107 (8.8%)	37	58	12
	No	1106 (91.2%)	343	511	252
Considered Vulnerable by Government Guidelines?	Yes	247 (20.4%)	29	41	177
	No	966 (79.6%)	351	258	87

To address research question 1.b, participants were grouped into low, medium, or high resilience groups (Fig. 1). After summing the four resilience items, 32.9% participants were classified as low-resilient, 36.4% as medium-resilient and 30.8% as high-resilient copers.

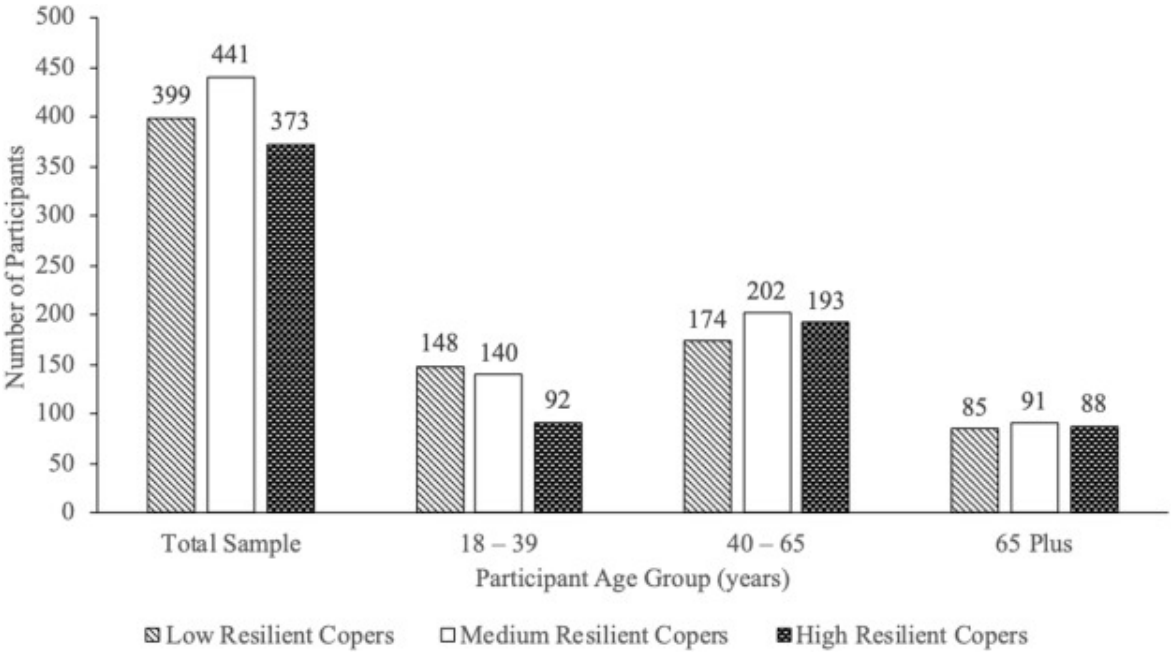

Fig. 1. Resilience groupings.

2.3. Measures

The online survey included five core components, (1) impact of COVID-19 restrictions, (2) alternative exercise methods, (3) resilience, (4) coping and (5) feelings about returning to sport. Brief forms were chosen for resilience and coping measures to reduce survey fatigue.

2.4. Impact of COVID-19 restrictions

'Impact of COVID-19 restrictions' refers to the overall effects of lockdown restrictions and cancellation of recreational provisions. An adapted version of the RAND Negative Impact of Asthma on Quality of Life (RAND-IAQL-12; Stucky et al., 2014) was utilised to assess the general effects of COVID-19 on participant's quality of life (QoL). 'For example, "I felt like I couldn't enjoy life because of my asthma" became "I felt like I couldn't enjoy life because of COVID-19". Some items were reworded to ensure an equal balance between positive and negative statements. Participants indicated how much they agreed with each statement on a Likert scale (1 = not at all through to 5 = very much). Scores across the 12 items were summed, with higher scores indicating a greater negative impact of COVID-19. RAND-IAQL-12 items have excellent internal consistency (marginal reliability = 0.93; Stucky et al., 2014) and preliminary validity evidence has been given for the measure (Sherbourne et al., 2014). Supplementary open-answer questions included "How do you feel COVID-19 has impacted on the amount of physical activity that you do?".

2.4.1. Alternative exercise methods

Participants were asked about the alternative exercise methods that they engaged in during lockdown. Focus was placed on the use of online workouts, fitness applications and home-gym set-ups due to

their accessibility during the COVID-19 lockdown. Participants were also asked to compare alternative exercise methods to their usual recreational sport by rating items such as “I am motivated to exercise during COVID-19 lockdown” as “less”, “equal” or “more”.

2.4.2. Resilience

The Brief Resilient Coping Scale (BRCS; Sinclair & Wallston, 2004) consists of 4-items (e.g. “I look for creative ways to alter difficult situation”) designed to capture tendencies to cope with stress in an adaptive manner, scored on a Likert scale (1 = does not describe me at all, 5 = describes me very well). Total scores were summed, with the following classifications: Low-resilient copers = 4–13 points, Medium-resilient copers = 14–16 points, High-resilient copers = 17–20 points. These classifications were made in accordance with BRCS procedures. The measure has acceptable internal consistency (r = 0.78; Kocalevent et al., 2017).

2.4.3. Coping

The Brief COPE (Carver, 1997) measures effective and ineffective ways to cope with a stressful life event and has a good Cronbach Alpha reliability rating of 0.85 (Yusoff, 2010). Participants considered how well statements presented by the Brief COPE described their behaviours during lockdown and gave a rating between 1 (I have not been doing this at all) and 4 (I have been doing this a lot). 28 items measure 14 coping strategies; self-distraction, active coping, denial, substance use, use of emotional support, use of instrumental support, behavioural disengagement, venting, positive reframing, planning, humour, acceptance, religion, and self-blame. Example items include “I have been learning to live with it”.

2.4.4. Returning to sport

Participants were asked “How are you feeling about returning to your recreational sport?” and “What (if anything) are you looking forward to/apprehensive about?“. Participants also indicated how they felt about returning to sport by rating statements including “I feel excited” and “I am worried about how physically fit I will be” on a Likert scale (1 = strongly disagree, 5 = strongly agree). Due to the specificities of COVID-19 and the contagious nature of infection, participants were also asked COVID-19 specific questions (e.g. are you “worried about coming into contact with others”?)

2.5. Data handling and analysis

Data was prepared for analysis by filtering incomplete/invalid questionnaires, classifying grouped responses (e.g. age, resilience) and calculating resilience and coping totals. Quantitative data was transferred into SPSS for analysis. As the data violated the normality assumption, multiple non-parametric tests were run including Kruskal Wallis (impact of COVID-19 for sex, age, resilience, time of year), Mann Whiney U (sport type, had COVID-19, vulnerability), and Wilcoxon Signed Rank (pre/during lockdown exercise levels and alternative methods) tests. Distributions were similar across all independent variables, as assessed by visual inspection of boxplots, and hence median (Mdn) scores were used to investigate differences. Percentage analysis was used throughout. Open ended questions were used to provide a more detailed understanding of the impact of COVID-19 restrictions

on participant's QoL, and their feelings about returning to sport. Using a thematic analysis approach, qualitative responses were first coded (selecting meaningful and relevant data) and then grouped into larger themes which were used for analysis (see Braun & Clarke, 2006).

3. Results

3.1. Impact of COVID-19 restrictions on QoL

Kruskal-Wallis tests revealed significant differences between sex for the impact of COVID-19 restrictions ($\chi2(2) = 24.232$, $p < .001$) with post-hoc analysis revealing females (Mdn = 24) were significantly more affected by COVID-19 restrictions than males (Mdn = 21; $p < .001$, $r = 0.14$), with no differences found between males or females and those who did not specify sex ($p = .823$ and $p = .952$ respectively) Significant differences in the Impact of COVID-19 restrictions between Summer (Mdn = 21), Winter (Mdn = 24) and Year-round (Mdn = 23; $\chi2(2) = 9.250$, $p = .010$) sports were also found. Post-hoc analyses revealed Winter sports were significantly more negatively affected than Summer sports ($p = .003$, $r = 0.08$)), but that there were no differences between Year-round and Winter sports ($p = .086$) or Year-round and Summer sports ($p = .171$). A Mann-Whitney U test found team (Mdn = 23) sports to be significantly more negatively impacted than individual (Mdn = 22) sports, $U = 195556.5$, $z = 2.135$, $p = .033$, $r = 0.06$. No significant differences were found if participants had had COVID-19 ($U = 61642.5$, $z = 0.715$, $p = .475$) or if they were considered vulnerable ($U = 116052.5$, $z = -0.662$, $p = .508$).

Overall, 42.6% of participants did more exercise, 27.6% did the same amount and 29.8% of participants did less exercise during lockdown. A Wilcoxon signed-rank test revealed that the average number of days a week that participants exercised significantly increased during lockdown ($z = 4.090$, $p < .001$, $r = 0.12$). Participants exercised on an average of 4 days before the lockdown and 5 days during the lockdown. Only 3.6% of participants exercised 0 days per week during the lockdown, yet 21.2% (up from 10.4%) exercised on all 7 days. As shown in Fig. 2, Wilcoxon signed-rank tests revealed that significant increases in activity were seen for the 40–65 ($z = 4.859$, $p < .001$, $r = 0.13$) and 65plus ($z = 3.369$, $p = .001$, $r = 0.10$) age groups, but not for the 18–39 group ($z = -1.468$, $p = .142$).

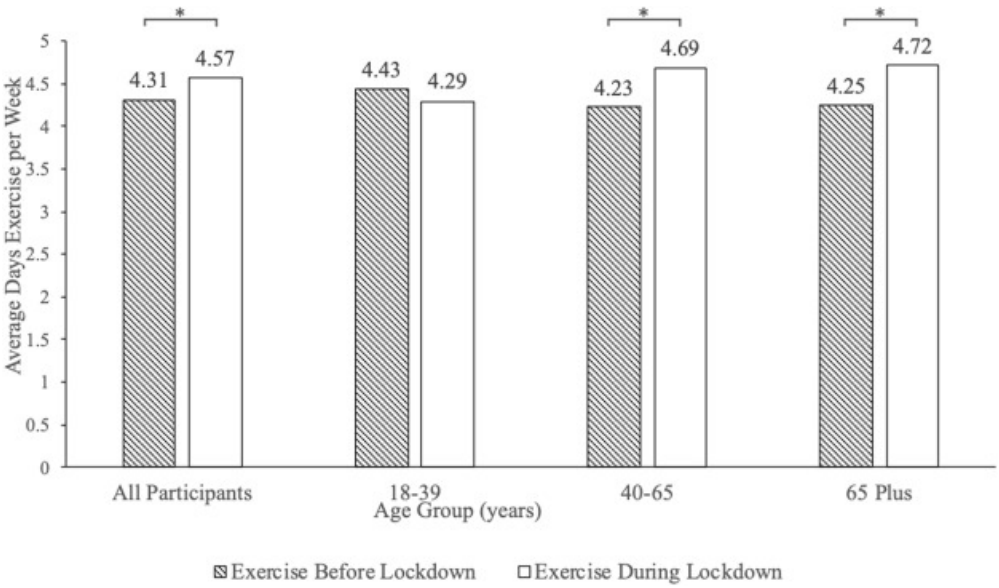

Fig. 2. Average number of days exercising per week, before and during lockdown.

Qualitative analysis indicated that individuals felt their amount of exercise had not changed, which conflicted with quantitative results. Participants felt that their choice of exercise methods had changed during lockdown, which subsequently reduced the quality/intensity of their participation. Participants overwhelmingly stated that they had missed the 'social aspects' and 'camaraderie' of not being able to attend their usual activity. The social atmosphere was missed, with numerous participants commenting on the absence of social activities beyond their sports involvement (e.g., coffee/drinks post-training). Participants also noted that they missed the physical benefits (e.g., fitness and skill development), the sport itself (especially where facility/equipment access had been removed, e.g., swimming), the sense of escapism (allowing for 'me time'), the competitive elements (e.g., friendly rivalry and setting goals) and the structure/routine of weekly sessions. Thematic analysis did not reveal notable differences between age or resilience groups.

3.2. Age group differences in impact of COVID-19

Median impact of COVID-19 scores were statistically significantly different between age groups, $\chi2(2) = 81.068$, $p < .001$. Subsequently, pairwise comparisons were performed using Dunn's (1964) procedure with a Bonferroni correction for multiple comparisons. Adjusted p-values are presented. The 18–39 (Mdn = 26) age group were significantly more negatively impacted by COVID-19 restrictions than the 40–65 (Mdn = 22; $p < .001$, $r = 0.23$) and 65plus (Mdn = 21; $p < .001$, $r = 0.21$) groups. No significant differences in impact were found between the 40–65 and 65plus age groups ($p = .355$).This is shown in Fig. 3.

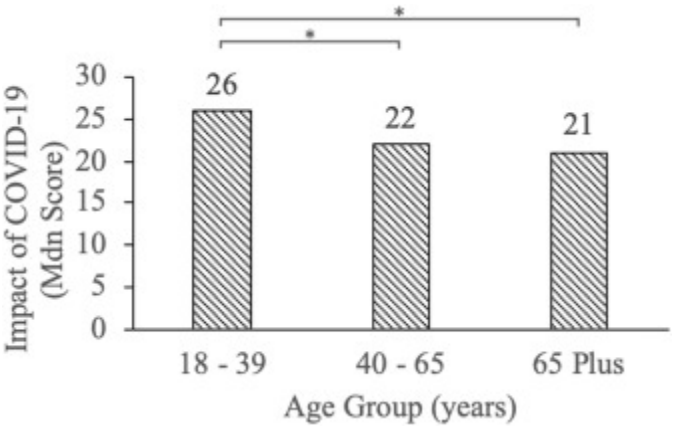

Fig. 3. Impact of COVID-19 restrictions as a function of age.

3.3. Resilience group differences in impact of COVID-19

A further Kruskal-Wallis test revealed impact of COVID-19 restriction scores were statistically significantly different between low (Mdn = 25), medium (Mdn = 22) and high (Mdn = 20) resilient copers, $\chi2(2) = 76.549$, $p < .001$. Post hoc analysis revealed statistically significant differences between all groups; low-resilient copers were more negatively impacted than medium ($p < .001$) and high ($p < .001$) resilient copers, and medium-resilient were more negatively impacted than high-resilient copers ($p = .01$; Fig. 4).

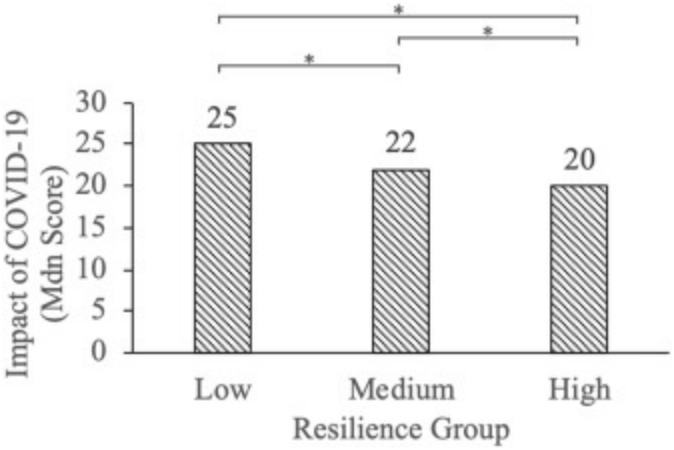

Fig. 4. Impact of COVID-19 restrictions as a function of resilience.

3.4. Coping strategies

Participant's highest scoring coping strategy on the BRIEF COPE was utilised for analysis. Where participants scored two (or more) strategies as highest, both were included. Overwhelmingly, the most common coping strategy was Acceptance (46%) with the next most popular strategies being humour (12%), active coping (11%) and self-distraction (10%). The remaining strategies saw less than 10% of percentage of participants scoring it the highest (Substance abuse (7%), Planning (6%), Venting (2%), Religion (2%), Emotional Support (1%), Informational Support (1%), Behavioural Disengagement (1%), Positive Reframing (1%), Denial (<1%) and Self-Blame (<1%)).

3.5. Alternative exercise methods

Fig. 5 shows the use of three alternative exercise methods (online workouts, fitness apps and home-gym set-ups) used before and during lockdown for all participants. Additionally, of the total sample, 25.3% of participants exercised virtually with others during the lockdown, utilising a multitude of platforms including Zoom, WhatsApp and Facetime.

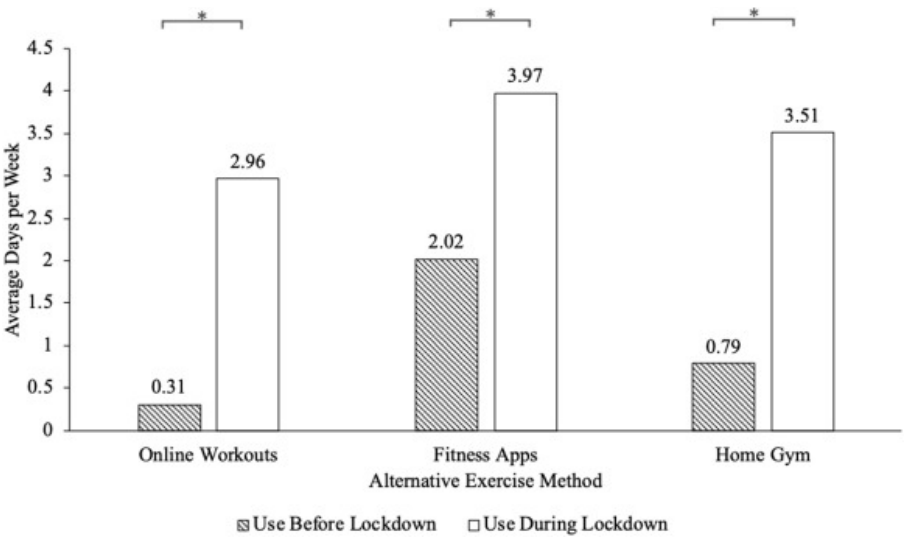

Fig. 5. Average use of online workouts, fitness apps and home gym set ups before and during lockdown.

3.6. Online workouts

A Wilcoxon signed-rank test showed a significant increase of use of online workouts from before (Mdn = 0 days) to during (Mdn = 3 days) lockdown ($z = -19.568$, $p < .001$, $r = 0.56$). 45.8% of participants indicated that they used an online workout during the lockdown period, with the most popular platform being YouTube (31.2%). Of the participants that used an online workout during lockdown, 82.9% indicated that they did not use them before lockdown (indicating 0 days per week).

3.7. Fitness apps

A Wilcoxon signed-rank test showed a significant increase of the use of fitness apps from before (Mdn = 0 days) to during (Mdn = 4 days) lockdown ($z = -12.537$, $p < .001$, $r = 0.36$), with 19.1% of participants now using fitness apps daily. 28.4% of participants indicated that they have used a fitness app during the lockdown. Of those that indicated they used a fitness app during lockdown, 51.5% had not used them before (indicated use on 0 days per week).

3.8. Home-gym set ups

A Wilcoxon signed-rank test showed a significant increase of the use of home-gym set ups from before (Mdn = 0 days) to during (Mdn = 3) lockdown ($z = -14.606$, $p < .001$, $r = 0.41$). 23.1% of participants indicated that they had used a home gym set up during the COVID-19 lockdown. Of those that indicated using a home gym set up during lockdown, 62.9% did so for the first time.

3.9. Feelings about alternative exercise

Fig. 6 shows participant's feelings about alternative exercise undertaken during lockdown; those indicating N/A are assumed to not be participating in any alternative exercise. Across all age groups, participants rated their alternative exercise as mainly less intense, less satisfying, less enjoyable and that they felt less motivated; the only exception being that those in the '65 Plus' group suggested they had equal motivation compared to pre-lockdown exercise. This suggests that specific comparisons between pre- and during-lockdown activities do not differ between age groups.

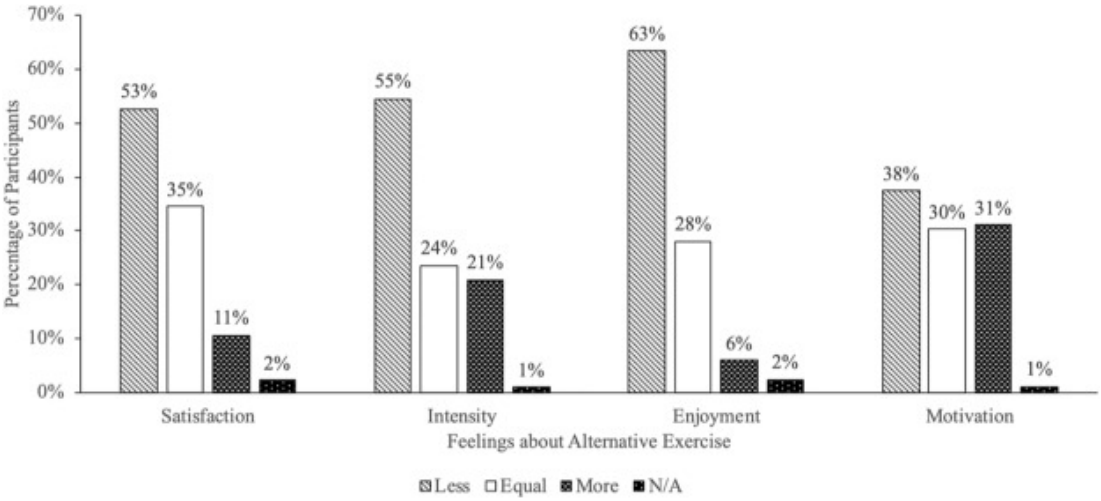

Fig. 6. Participant's feelings about their alternative exercise during lockdown.

3.10. Age differences in alternative exercise

The most common use of daily exercise allowance for 18–39 year olds was to 'Run' (41.6%), whereas both the 40–65 and 65 Plus groups favoured walking (43.4% and 68.2% respectively). Across all age groups, the use of online workouts, fitness apps and home gyms increased.

3.11. Feelings about returning to sport

84% of participants strongly agreed/agreed with the statement "I feel excited" when thinking about returning to sport, with 91.8% of participants strongly agreeing/agreeing that they "missed taking part in their recreational sport". Participant responses to positive questionnaire items regarding returning to sport are shown by Fig. 7. Most participants are 'excited', 'looking forward to it' and 'can't wait' to return to their sport, but only when it is safe to do so. Mixed feelings about returning to sport were also noted, with participants from all age groups suggesting they would 'carry on with zoom sessions', are 'enjoying their new routine', and that they have 'adjusted well'. All ages are looking forward to the 'social' aspects, with most participants (94.2%) looking forward to being able to see their friends. Other factors included being 'competitive' and 'part of a team', returning to a regular 'routine' and the regaining of 'physical fitness'; 86.2% of participants strongly agreed/agreed that they are "looking forward to the physical health benefits" of returning to their sport.

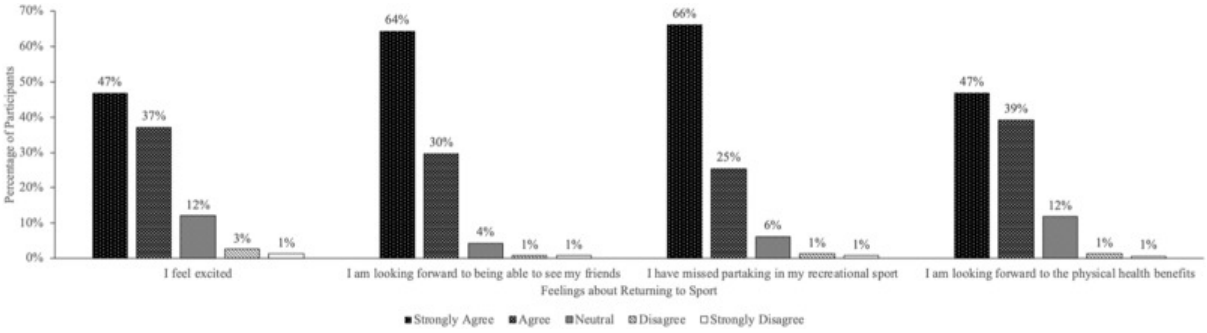

Fig. 7. Participant's positive feelings about returning to sport.

Beyond feelings common across age groups, the two younger groups suggested anticipation of 'access to equipment', with those in the 40–65 group also looking forward to the travel that is associated with training/competition. The 65 Plus group indicated that they are looking forward to the 'enjoyment' of their sport and being able to 'get out of the house' for a 'change of scenery'.

Participant responses to negative questionnaire items regarding returning to sport are shown by Fig. 8. Only 5.3% of participants strongly agreed with the statement "I feel apprehensive", with the greatest number of participants suggesting they strongly disagreed (28.3%); many participants indicated they were apprehensive about 'nothing'.

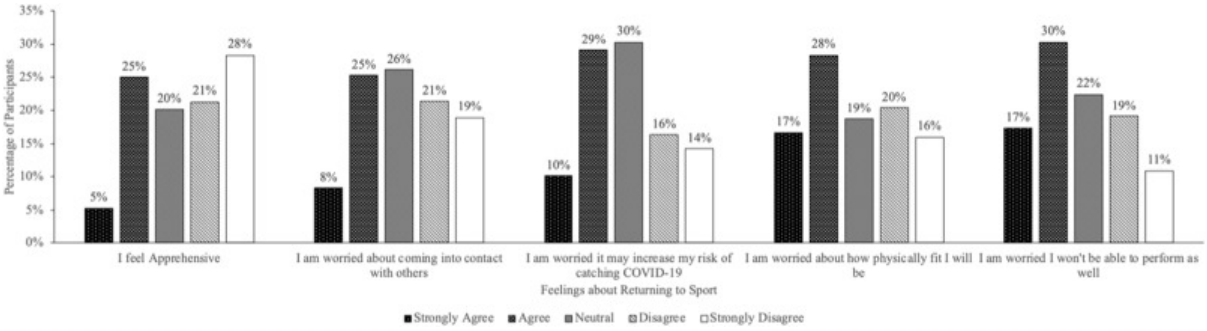

Fig. 8. Participant's negative feelings about returning to sport.

3.12. Age differences in feelings about returning to sport

Across all age groups, participants showed concerns about 'returning too soon' and the implementation of social distancing – especially in regard to the logistics of being 'in a crowd', and behaviour of others (33.6% of participants strongly agreed/agreed that they were "worried about coming into contact with others"). Participants were also worried about their loss of 'fitness' and 'skill level' (47.6% strongly agreed/agreed to the statement "I am worried that I will not be able to perform as well as I did before the COVID-19 lockdown period", with 45% strongly agreeing/agreeing with the statement "I am worried about how physically fit I will be"). However, 30% and 36.4% of participants strongly disagreed/disagreed with the former statements respectively, indicating that they have maintained their fitness during lockdown.

The two younger groups indicated they were also worried about 'injury'. All groups were apprehensive that not all previous training partners would return, with the older group also having related concerns about the death of friends. Both younger groups were concerned about spreading COVID-19 and the risk to older participants whereas conversely, the older group indicated they were worried about catching the virus and the attitude of younger players in following new protocols.

4. Discussion

This study investigated the psychosocial impact of COVID-19 restrictions on recreational sport participants, what alternative exercise methods have been used and feelings about returning to recreational sport. Three main research questions were addressed: (1) What is the impact of COVID-19 restrictions on recreational sports players, and does this differ between (a) age, (b) resilience groups? (c) what coping strategies did recreational sports players use during lockdown? (2) What alternative exercise methods have been sought, and (a) does this differ between age groups? (3) How are recreational sports players feeling about returning to sport, and (a) does this differ between age groups? Findings demonstrated a significantly greater negative impact of COVID-19 restrictions for females, winter sports and team athletes, 18-39-year-olds

and low-resilient copers. However, no differences were found between participants who had/had not had COVID-19 or were/were not considered vulnerable by government guidelines. Physical activity significantly increased between pre- and during lockdown with 42.6% of participants doing more exercise, 27.6% doing the same amount and 29.8% of participants exercising less during lockdown. Overall, acceptance was the most used coping strategy. Alternative exercise methods saw significant increases in use of online workouts, fitness apps and home-gym set ups. Participants are excited about returning to sport but are concerned by the logistics of social distancing, especially in close-contact sports.

4.1. Impact of COVID-19

The first research question explored the impact of COVID-19, addressing how this differs between age and resilience groups, and the use of different coping strategies. Despite research suggesting younger adults may be more prepared to cope during the pandemic (Shanahan et al., 2020), the younger age group were negatively affected most by lockdown. This may be due to the high prevalence rate of common mental disorder symptomology among adolescents and young adults when compared to

other age groups (Cadigan et al., 2019). During lockdown, younger individuals spent more time thinking and worrying about the pandemic (Huang & Zhao, 2020) and experienced high levels of loneliness (Groake et al., 2020); which may have contributed to the lower quality of life scores. Additionally, as younger adults (aged between 16 and 34) typically engage in more organised aerobic, strength and sporting activities than older adults (e.g., Baker et al., 2010; Guthold et al., 2008; Scholes, 2017), it follows that the cancellation of recreational provisions impacted this age group more.

The greater impact of COVID-19 restrictions for female athletes complements findings that suggest females have displayed higher state anxiety during COVID-19 when compared to males (Antunes et al., 2020). Results also complement the findings of di Fronso et al. (2020) who found female Italian athletes reported higher perceived stress and dysfunctional psychobiosocial states compared to men during lockdown. Females report strong social motives for sports participation (Whitehead et al., 2019) and therefore the loss of sports engagement during lockdown will have also impacted social opportunities, negatively affecting quality of life. Similarly, team sport athletes show higher social or affiliation motivations for exercise engagement (Molanorouzi et al., 2015) suggesting that their participation revolves around interactive elements of training/competition. The sudden requirement for team-based athletes to exercise alone and temporarily become individual athletes may have also contributed to lower quality of life scores for females and team athletes, especially as individual sport athletes are more likely to report anxiety/depression (Pluhar et al., 2019). Social benefits of physical activity, especially for team-based sports, are well established and are known to mediate positive health outcomes by providing opportunities for social interaction, companionship, and feelings of belonging and community (Eime et al., 2013), many of which were mentioned by participants in this study. Playing on a team encourages both fitness and psychological skill development (Kajbafnezhad et al., 2011). Legg et al. (2017) noted that participants often interact with teammates and other league players outside of training/matches, which would also have been prevented by COVID-19 restrictions. Interestingly, di Fronso et al. (2020) found no differences between individual or team athletes' perceived stress or psychobiosocial state in response to lockdown, conflicting with these findings. Their sampling of higher-level athletes (regional level and above) may have influenced this result, as these athletes likely had access to better remote training/coach support irrespective of individual/team set-ups, unlike recreational athletes who tend to rely more on teammates, rather than support staff.

As high anxiety, depression and stress are predicted by low resilience levels (Hjemdal et al., 2011), and low-resilient individuals are known to have poorer quality of life (Tempski et al., 2015), the results confirmed expectations that they would show higher impact of COVID-19 scores. Typically, low-resilient copers report lower perceived social support and higher levels of psychological distress (e.g. Pidgeon et al., 2014) both of which were likely exaggerated by lockdown restrictions, especially as access to social support was minimised. This, along with findings showing high resilience to associate with positive outcomes including lower depression (e.g. MacLeod et al., 2016) could explain why low-resilient individuals scored higher on the Impact of COVID-19 restrictions measure compared to individuals with medium/high resilience. Future research should investigate the higher effect of COVID-19 restrictions on low-resilient copers in more detail.

Investigation into the impact of COVID-19 on different sporting seasons was undertaken. Lockdown started towards the end of sports' winter season and when training for summer sport was yet to resume, potentially explaining the greater negative effect on winter sport participants. Title-deciders or play-offs for winter sports were postponed or cancelled whereas summer sports saw no initial impact, explaining this difference. The no difference in impact between winter and year-round sports

also supports this, as those in year-round sports also will have seen significant impact to their training and competition arrangements (unlike those in summer sports).

The way in which individuals coped with the restrictions varied, however, acceptance was the most common coping strategy. Acceptance is a functional coping response that sees an individual attempt to deal with a situation and is particularly important in circumstances where a stressor must be managed (as with COVID-19), as opposed to circumstances in which the stressor can be changed (Carver et al., 1989). Across England, lockdown restrictions were police enforced and therefore public acceptance was necessary, potentially explaining the high frequency in this sample. Aside from acceptance, other popular strategies included humour and distraction, complementing findings suggesting that acceptance and positive reframing were associated with reducing COVID-19 stress (Shanahan et al., 2020). Participants in this study might have positively reframed their allocated daily exercise allowance as a chance to build physical health and maximise on their limited opportunity to leave the household, contributing to their acceptance of the situation. Clubs may encourage specific coping strategies within subsets of their participants alongside acceptance and general physical activity guidance as restriction measures persist. For example, Mosewich et al. (2013) suggested that fostering a self-compassionate frame of mind is a potential coping resource for female athletes dealing with negative events in sport, which may be effective in reducing the higher COVID-19 impact seen on females in this study. Further research may investigate effects of different coping strategies in relation to impact scores, age, resilience level and type of sport.

Contrary to articles suggesting COVID-19 restrictions cause decreases in physical activity, overall, recreational athletes increased their amount of exercise during the lockdown, aligning with active subsets from Canada (see Lesser & Nienhuis, 2020) and Belgium (see Constandt et al., 2020) who also saw increases.

During lockdown, participants stated they had extra available leisure time that enabled them to participate in more exercise, contributing to the exercise increases seen in this study. The continued promotion of exercise and healthy living by the English media and health authorities, combined with the lack of alternative recreational activities available during lockdown may also have contributed to individuals participating in more exercise. However, many individual factors contribute to the choice to take up leisure time physical activity (see Engberg et al., 2012) with increased leisure time also potentially permitting more sedentary lifestyles. With this in mind, the recruitment of recreational athletes potentially influenced the overall increase in participation in this study.

Recreational athletes are regularly active (and hence potentially more inclined to use spare time for exercise) and are also able to utilise networks of players and coaches to assist with alternative exercise. Additionally, active individuals are known to increase physical activity engagement in stressful times in efforts to 'cope' (Leigh-Hunt et al., 2017) which is supported by active individuals reporting more physical activity since the outbreak of COVID-19 (Lesser & Nienhuis, 2020). Additionally, active individuals (such as recreational participants) typically report higher levels of autonomous motivation than those who are inactive (Lesser & Nienhuis, 2020). Autonomous motivation regulation leads to better psychological adjustment and well-being (Jowett et al., 2013) and positively correlates with physical activity involvement (Bagøien & Halvari, 2005). Therefore, higher levels of autonomous motivation and subsequently, less reliance on others (e.g. club members) for participation would support continued exercise and enhanced wellbeing during lockdown for recreational athletes. Current research suggesting exercise decreases have used unspecified samples/members of the public with no mention of sporting background which may have impacted outcomes by unknowingly selecting high/low active individuals. Furthermore, Di Fronso et al. (2020) suggested that elite athletes reported lower perceived stress and higher functional

psychobiosocial states than regional athletes during lockdown; further suggesting that higher sporting involvement mitigates against the impact of COVID-19.

4.2. Alternative exercise methods

Recent articles (e.g. López-Bueno et al., 2020; Maugeri et al., 2020) have focused on activity changes but few have looked at what participants have engaged in during lockdown. Considering the significant positive impact of physical activity on well-being during the pandemic, encouraging home exercise is essential with some even suggesting that exercise should be promoted as much as social distancing (Matias et al., 2020). Lesser and Nienhuis (2020) found that during lockdown individuals were able to maintain their typical physical activity choices, yet comments from participants in this study would suggest that this is highly sport dependent. More specifically, cyclists reported being able to continue with regular routines (albeit without training groups) whereas swimmers who had no access to pools were forced to alter their activity type and therefore did not maintain typical activities.

Despite engagement with alternative methods, participants deemed them to be less satisfying, less intense, less enjoyable and claimed to be less motivated to exercise compared to their usual recreational activity. Lesser and Nienhuis (2020) also found participants reported lockdown exercise to have less benefit and less enjoyment, suggesting that activities engaged with during lockdown must be altered to achieve the same experience as typical sport. The removal of factors associated with recreational sport (e.g. social aspects and support of teammates/coaches) may explain these findings, with most participants now exercising alone. Furthermore, it is known that during injury rehabilitation (a comparative time away from sport) athletes face motivational challenges including apathy and poor adherence (Johnston & Carroll, 1998), which reflects the feelings of participants in this study. It is therefore important that clubs ensure effective activity is being managed both during lockdown and injury.

Despite some negative feelings, use of online workouts and fitness apps increased significantly for recreational athletes during lockdown, with several participants indicated that they would continue with alternative methods post-COVID-19, suggesting a beneficial effect of lockdown in exposing recreational athletes to new ways of exercising. Morrow-Howell et al. (2020) suggested that lockdown has provided a chance for adults (especially older adults) to become more comfortable with technology use and for community and health-care providers to offer remote programming, which was also reflected in this study. As participants wish to continue with online 'Zoom' classes, these could be utilised by clubs in addition to typical sessions whilst social distancing restrictions are still in place and beyond.

The increase in participants' exercise overall, combined with the increased use of online workouts and fitness apps, supports research suggesting technological applications might help to stimulate exercise (Middelweerd et al., 2014) and that the use of fitness apps positively affects individual's attitudes and physical activity engagement (Gabbiadini & Greitemeyer, 2019). Apps provide opportunities to deliver personalised materials to promote physical activity (Krebs et al., 2010), potentially replacing the position of 'coach' whilst in lockdown. Many participants suggested that their clubs/coaches had reached out to them online (e.g. WhatsApp messaging or Facebook) to provide virtual guidance for lockdown activity, which may have also contributed to the increases in technology use. Many participants also commented on the use of fitness apps in conjunction with wearable technology (e.g. smart watches) which may have further enhanced participants' motivation to increase activity levels as wearable fitness trackers support more autonomous motivation for physical activity (Nuss et al., 2020).

Although it is recognised that wearable technology and smartphone use promotes activity, their ability to increase activity levels is estimated at small/moderate, with challenges also surrounding accessibility for those that are the most physically inactive (Gal et al., 2018), and those with lower socio-economic status'. In addition, research prior to the pandemic concluded that social support in online networks was ineffective for increasing physical activity (Zhang et al., 2016). However, given the unique COVID-19 circumstances and the subsequent severe social lockdown restrictions that have been imposed, the use of technology as a substitute for recreational clubs has been widespread and may explain these conflicting findings and why many participants engaged with more exercise as a result.

Google searches of 'home-based exercise' increased dramatically in the first weeks of lockdown (Ding et al., 2020), which is supported by participants in this study who implemented new home gym set-ups. The implementation of home gym set-ups during lockdown may encourage more home-based activity post-COVID-19 and could be utilised by clubs to complement group-training sessions. Little research has investigated the use of home gyms in the general population, with most studies exploring the effects of home-based exercise on clinical populations, yet findings suggest that home-based exercise is also effective for recreational athletes. For at risk populations, such as transplantees or those with cardiovascular disease, home-based physical activity programmes have been found to be feasible, safe, and effective in promoting health benefits (Peçanha et al., 2020) and therefore could be equally as successful for recreational athletes (and those considered clinically vulnerable to COVID-19) during lockdown. Participants suggested that access to equipment was difficult during lockdown, with many having to purchase new items to assist with home exercise. Looking forward, clubs may look at lending kit/equipment to players during future lockdowns to support their athletes and reduce this need. Clubs should attempt to mitigate any risk of home-based exercise for their athletes by ensuring lent equipment is safe to use, and that athletes are participating in appropriate level activities.

4.3. Feelings about returning to sport

The final research question assessed feelings about returning to sport and whether this varied as a function of age. Overall, participants were eager to return to sport and were looking forward to the physical and social aspects, competitiveness and returning to a routine. This anticipation of return is promising for sports clubs as it shows members are willing to restart training imminently, however, addressing concerns highlighted by players is of greater interest to clubs when managing the return of recreational sport.

Participants were apprehensive about returning to sport too soon and the logistics of implementing social distancing, especially in close-contact sports. To overcome this, sports clubs should contact participants before their reopening to communicate new measures and initiate discussion regarding concerns. Prior discussions will also allow members to rebuild connections and to see who will be returning to training, this will likely be useful as all age groups expressed apprehension that not all of their previous training partners would return. The 40–65 age group also worried about their return to work impacting their available time to continue with sport, implying that the increased amounts of leisure time did allow for more exercise, supporting previous suggestions in this study. Clubs may consider this when allocating training times for participants. Aside from time, Constandt et al. (2020) found that a main obstacle for exercise during lockdown was the fear of COVID-19 contamination, which may transfer into the return to sport. Younger age groups were more concerned about spreading the virus, whereas the older group worries about catching it and were concerned about younger players following new COVID-19 protocols. However, younger participants demonstrated awareness of older member's health and with the strong COVID-19 vaccine roll out

continuing, older individual's concerns may be unwarranted and should be addressed by clubs to ease apprehension.

When considering their return to sport, injured athletes often encounter self-confidence concerns and become fearful of reinjury (Kamphoff et al., 2013) which was reflected by findings. Worries about injury were particularly present in the two younger groups; potentially mirroring their involvement in more vigorous activities that are more injury-provoking. Sports clubs should recognise that athletes may return to training in varying physical conditions and should be mindful of the intensity of initial sessions to prevent injury. In all, participants expressed eagerness to return to recreational sport, yet concerns suggest that effective communication (regarding new protocols, who will be returning, level of re-entry and expectations) from clubs prior to the restart will reduce anxiety and encourage more to return.

Although this study reached a large sample of respondents and has significant implications, some limitations are present. First, as the questionnaire was released forty-four days after the lockdown started, findings may not reflect the immediate impact of COVID-19 with the reliance on self-reported retrospective answers potentially leading to information recall bias. Second, the disparity between participants responding in the first of the six weeks of data collection, compared to those responding in the final days may have impacted findings, with the effects of pro-longed lockdown measures and social isolation over longer periods of time influencing latter respondents more. Third, the predominant ethnicity was Caucasian, which although may represent the range of participants across recreational activities, does not reflect the total population. As ethnic disparities may impact the severity of COVID-19 health problems (WHO, 2020) further investigation into the feelings of minority demographics into their return to sport may differ from that expressed in this sample. Finally, despite replies from across England, geographical location of respondents was not included. This may have provided additional context to participants' responses, given further insight into the impact of COVID-19 across England and helped inform location-specific reintroductions.

5. Conclusion

In conclusion, findings suggest that although the impact of COVID-19 differed between subsamples, engagement with alternative exercise methods was high, with particular emphasis on use of online, fitness apps and home-gym workouts. Excitement was the prominent feeling amongst most participants in returning to sport, yet many were concerned over the implementation of social distancing measures. These findings have important implications in understanding the effect of COVID-19 restrictions on recreational athletes and in informing future strategies for potential lockdowns and the reintroduction of sporting provisions, meeting the study's objectives. The findings of the current study indicate that local clubs and larger sporting governing bodies should endeavour to promote aspects of home-based exercise for their members that will ensure participants can continue to engage in exercise whilst in lockdown, utilising both online and low-technological communication methods. Clubs should also encourage discussion prior to recommencing to alleviate concerns and highlight new protocols that will be introduced to meet COVID-19 requirements. There is, however, a current lack of research examining the long-term effects of lockdown exercise and the reintroduction to sport. Future research should therefore first attempt to monitor the reinstallation of club provisions, assessing participant feelings and ensuring that clubs/members are prepared for potential re-entering into lockdown. Research could also explore the upkeep of alternative exercise methods to evaluate effects on long-term behaviour change, in response to the positive findings from this study.

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Contributions

Anna May Martin: Conceptualization, Methodology, Formal Analysis, Resources, Writing – Original Draft Francesca Champ: Conceptualization, Methodology, Writing – Review & Editing. Zoe Franklin: Conceptualization, Methodology, Resources, Writing – Review & Editing.

Declaration of competing interest

None.

Appendix A. Supplementary data Supplementary data to this article can be found online at https://doi.org/10.1016/j.psychsport.2021.101978.

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